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MEASURING SPA TOURISM SUSTAINABILITY AND SEASONALITY IN SERBIA: CASE STUDY OF THE SPA CENTRES

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Abstract

Nowadays, we are witnessing the ever-growing popularity of spa centres of which there are more than fifty active spas with thermal mineral springs and different capacities for tourists in the Republic of Serbia. Seasonality has a significant impact on the profitability of these destinations, even on sustainability, which is a decisive factor for the increasing number of visitors. The focus of the paper are the most notable Serbian spa centres, i.e. Vrnjačka Banja, Sokobanja, and Banja Koviljača. The Gini index and the Lorenz curve were used to assess the seasonality and imbalance in the monthly distribution of the number of tourists' overnight stays in the mentioned destinations for the period 2019-2023 influenced by COVID-19 virus pandemic. During this period, the institutional causes changed and had a significant influence on all aspects of tourism, including the seasonality. To reduce the influence of seasonality and increase the sustainability of selected resorts, it is important to combine different types of tourism, expand the services offered, and even create links to other nearest tourist centres (e.g. mountain centres).

Key Words: *tourism, seasonality, COVID-19 virus pandemic, Serbian spa centres, Gini index, Lorenz Curves*
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Introduction

In general, there are more than fifty active spas with thermal mineral springs and different capacities for tourists in the Republic of Serbia (Perić et al., 2017). Among them, Vrnjačka Banja is the most notable spa resort in central Serbia. In 2023, this spa recorded more than 18,000 overnight stays by tourists in the first three months of 2023 alone. Six mineral springs are active in the area of Vrnjačka Banja, four of which are used for medical therapy: Topli, Jezero, Slatina, Snežnik, Borjak and Beli (Stanković, 2005). Although the main purpose of the tourists to visit this place is health tourism (wellness and medical tourism), the cultural events, such as the Carnival of Vrnjci, expand the tourist offer. This destination is known for its park with over 200 trees and unique flower roundels with a total area of 1630m^2. In addition to the unique nature in the centre of this tourist attraction, the spa is located at the foot of Mount Goč, which provides opportunities for the development of various types of tourism.

Another attractive spa, Sokobanja, is located in the eastern part of Serbia. It is surrounded by numerous mountains, including Rtanj, Ozren, Devica and Bukovika. Since it is located in a valley, the higher oxygen content of the air and the negative ions have numerous positive effects on the health of visitors. The six terminal springs (Sveti Aranđel, Preobraženje, Banjica I and II, Pijaca, Zdravljak) are located in Sokobanja, mainly with healing effects to respiratory disease and rheumatism. Besides medical tourism, the Sokobanja basin has numerous heritage features (Bratić et al., 2020), thus it has a great potential for geotourism, which is an increasingly global phenomenon.

Banja Koviljača is located in the Western Serbia region, in the Valley of Drina River. Besides colorful nature and notable cultural heritage, Banja Koviljača has plentiful springs of sulfurous water (19°-28° C) and therapeutic mud, which are used for treatment by bathing, drinking, and sprinkling (Krsmanović et al., 2016). Among visitors of Banja Koviljača, health tourism is extremely dominant and has a long tradition since ancient times. Like Vrnjačka Banja, this spa has a beautiful park for walking on the paths, and even more, the park continues in a forest, which is ideal for rest and picnics. Therefore, besides medical treatment, the spa has facilities for recreation and sports.

Analyzing seasonality from destinations is an essential element when managing tourism destinations (Þórhallsdóttir et. al, 2017). Owing to the complexity of tourism, this data can give the direction to decrease the seasonality, since in a particular case, the biocultural heritage gives a lot of possibilities for the development of a different type of tourism (gastronomy, geotourism, cultural tourism, etc.).

The aim of the manuscripts is to determine the variability in the seasonality of the tourist demand of three selected spas in Serbia (i.e. Vrnjačka Banja, Sokobanja, and Banja Koviljača), considering the influence of COVID-19 virus pandemic in order to provide guidance or develop the strategy and other economic measures to reduce this phenomenon aiming at the balanced use of tourist facilities.

Literature review

The seasonality of tourism is a remarkable phenomenon that harms the economic, social and environmental aspects of tourist places (Corluka, 2019). The unique and precise definition of this global phenomena does not exist, while notable definition was estimated by Hylleberg (1992) : „Seasonality is the systematic, although not necessarily regular, intra-year movement caused by the changes of weather, the calendar, and timing of decisions, directly or indirectly through the production and consumption decisions made by the agents of the economy" (p. 4). Although the phenomena affect all touristic destinations, there are gaps in literature data about them, it must be highlighted that most destinations have specific causes that influence the seasonality.

In general, the tourist flows are concentrated in a specific time of the year (Rico et al., 2021), which is due to natural and institutional causes. Generally, natural causes are conditioned to weather conditions, while institutional causes are related to common social practices (e.g. school vacations, state holidays) (Suštar & Laškarin Ažić, 2019; Corluka, 2019). Generally, the part of period the touristic capacity is overcrowded during the peak of season, that influences the price of accommodation as well as tourist satisfaction with the services in these specific conditions.

The dominant natural cause for visiting spa centres is the thermal mineral waters (Pavlović et al., 2021). The results of Pavlović et al. (2021) pointed out that investigated spa centres (Vrnjačka Banja, Sokobanja, Niška Banja, and Prolom banja) in the period before pandemic (2010-

2019) still do not have particularly high degree of seasonal concentration of tourists.

Global pandemic created a unique institutional cause (i.e. limited and/or restricted mobility) never before implemented in the tourist industry that causes enormous economic losses and unprecedented change in the whole tourism industry (Trajkov et al., 2022). According to data published by Trajkov et al. (2022), restrictions amid the health crisis significantly decreased the total tourist overnights in post pandemic period in the Republic of Serbia, both domestic and foreign, compared to the previous years. Furthermore, these authors examined the seasonality during post covid period and established that the health crises have an impact on increasing tourism seasonality in all statistical regions in Serbia. Since the spa resort was the most popular tourist destination in the Republic of Serbia (RoS), it is valuable to investigate the effect of covid crisis on their seasonality.

Despite a positive economic impact on the local community that the increase in tourist numbers has, there is also a negative impact in terms of ecological issues, such as the degradation of all elements of the environment (Lakićević et al., 2022). Therefore, it is valuable for tourism organizations to determine the distribution of tourists by place and time to take measures against seasonality in order to prolong the tourist season and create „all time" destinations enriching content.

Methodology and Research

Areas of study

In this paper we present a method which could be useful in investigations of flowing tourists distribution in time and space during the period 2019-2023 influenced by COVID-19 virus pandemic. For the analysis, three spa tourism destinations with different properties in the Republic of Serbia were selected: Vrnjačka Banja, Sokobanja and Banja Koviljača. The mentioned spa centres are easily reached from Belgrade, the capital town of Serbia. Since these destinations are attainable through the year and have dissimilar target tourist groups and attractions, it can be concluded that the relevant target groups differ and can influence seasonality. Also, if we take a look at the offer and infrastructure of these destinations, they are quite different. At the end of this part of the paper,

we want to emphasize that these spa centres belong to three different regions according to the regional divisions of the Republic of Serbia.

Gini index

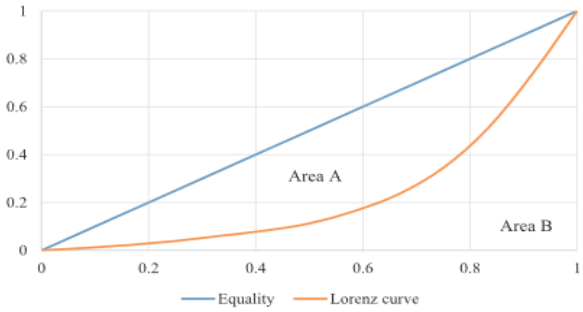
One of the most used tools in analyzing seasonality is the numerical value of the Gini coefficient (Duro, 2016). Here we used the numerical values of this index in order to explore the degree of inequality of tourist overnight stays in the selected spa centres in Serbia. The official data available on the site of the Statistical Office of the Republic of Serbia (SORS) were used in this research, more precisely the data related to the monthly tourist overnight stays in the considered spa tourism centres for the period 2019-2023.

The standard formula for calculating the Gini index can be expressed as it was given in (Lundtorp, 2001)

$$GiniIndex = \frac{2}{n}\sum_{i=1}^{n}(x_i - y_i) \quad (1),$$

and it is derived from the element of the Lorenz curve. In the previous formula, n is the total number of proportions and it can be expressed in the months, weeks, days or other units, and in our case$n = 12$, because we calculate the degree of inequality of tourist overnight stays in months. Further, x_i represents the rank of the proportion, e.g. 1/12, 2/12…, in the case of months, 1/52, 2/52…, in the case of weeks, or days 1/365, 2/365…etc., so, there is $x_i = \frac{i}{n}$, while y_i is the cumulative relative frequency, and it refers to the cumulative element of the Lorenz curve.

Figure 1: *Plot of the Lorenz curve*



Source: *Authors' research*

Namely, the Gini coefficient is the values of the surface between the Lorenz curve (area marked with A on Figure 1) and the 45° line divided by the whole surface below the line (area marked with B on Figure 1):

$$\frac{A}{A+B}.$$

In the process of calculation the Gini index, given with formula (1), the values of tourist overnight stays need to be ordered by size in ascending way (from the lowest value to the highest value) and then these values need to be normalized by the standard formula:$f_i = \frac{v_i}{v_0}, i = 1, \ldots, 12$, where v_i is the cumulative number of overnight stays starting from January to December, while v_0 is the total number of overnight stays during the year. If we summarize the values of f_i, it should be one. Based on the previous, we have

$$y_i = \frac{v_1}{v_0} + \frac{v_2}{v_0} + \ldots + \frac{v_i}{v_0} = \sum_{j=1}^{i} f_j$$

and

$$y_n = \sum_{i=1}^{n} f_i = 1$$

Also, there are available other variations of this formula and interpretations but in this paper, we have used this one (see for example Pavlović et al., 2021). The calculation for each spa was done in MS Excel using the procedure described above, but due to the space limitations it is not presented in the paper.

Further on, if we return our consideration about values of the Gini index but using the graphic representation on the Figure 1, we need to find the surface below the Lorenz curve (marked on the plot with B). It could be done with finding the mean value of two neighboring points and multiplying the calculated mean by the values of rectangle width. The x-axis is normalized to one and therefore the width of each rectangle is 1/n (in our case 1/12). When the n values are summed up we have the values of surface of the region B. Surface marked with A is given with the formula:

$$A = 0.5 - B.$$

Finally, the Gini index is given with

$$GiniIndex = \frac{A}{0.5},$$

(see for example Þórhallsdóttir et al., 2017).

The Gini index has a value between 0 and 1, where 0 denotes complete equality and the lowest degree of seasonal tourist concentration and 1 denotes perfect inequality, or a high degree of seasonality concentration. The values of the series are more unevenly scattered the closer the value is to 1, whereas the values inside the series are more equally distributed the closer the value is to 0. The Gini index can be used to compare data and analyze its distribution (dispersion) in a flexible and reasonably easy-to-understand manner. Several different indices have been developed for measuring inequality in place of the Gini index, the most well-known of which being the Atkinson and Theil indices (Osberg, 2017).

With the expansive growth of tourism, it is difficult to divide the tourist season into summer and winter seasons (or eventually shoulder seasons – spring and autumn) and talk about their exact boundaries. Because of that, we have assumed that each season is uniform regarding target groups and travel behavior.

This paper is our attempt to answer the following two hypothesis using the mentioned mathematical tools and described methodology:

H1*: Seasonality in the selected spa tourism centres in the RoS is heterogeneous.*
H2*: Within the observed COVID-19 crisis period (2019-2023) the Gini index values of the selected spa destinations in the RoS are comparable.*

Results

In this part of the paper we calculated the values of the Gini index in the three selected spa centres in the Republic of Serbia: Vrnjačka Banja, Sokobanja and Banja Koviljača. These spa centres are different in the sense of the level of tourism development and potential, recognition in the market, tourist stays, services, and offers.

Considering data given on site of the Statistical Office of the Republic of Serbia the selected spa is Vrnjačka Banja, because in the period 2019–2023 it had the largest number of tourist overnight stays – 907,892 in 2019. The second one is Sokobanja, with 767,725 overnight stays in 2022, and the third one is Koviljača with 130,896 overnight stays in 2019.

The most visited months for tourism in the discussed spa centres are from May to August. Based on the presented results, it is evident that these Serbian spa centres have a dominant monthly season caused by both natural and institutional causes.

Table 1: *Gini index in considered spa centres for the period 2019–2023*

Year	Vrnjačka Banja	Sokobanja	Banja Koviljača
2019	0.35	0.39	0.28
2020	0.47	0.53	0.31
2021	0.37	0.43	0.22
2022	0.28	0.43	0.31
2023	0.26	0.40	0.16

Source: *Authors' findings*

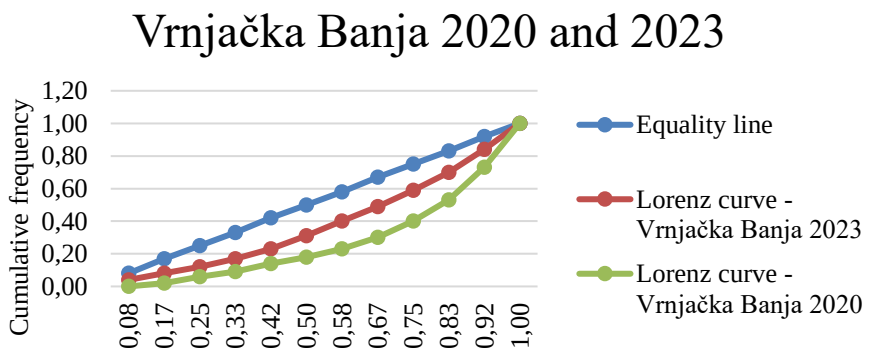
The data given in Table 1 show that Vrnjačka Banja and Sokobanja have a higher index than Banja Koviljača. For Sokobanja, the calculated values of the index vary from 0.39 to 0.53, and for Vrnjačka Banja, these values vary from 0.26 to 0.47. Consequently, we have that the first considered hypothesis is confirmed, while the second one is rejected. Also, we want to emphasize that among the considered spa centres, Vrnjačka Banja has the lowest value of the index in 2023, but for the 2020 the value of the Gini index in this spa is 0.47, and this year was hit by the COVID-19 virus pandemic. It can be concluded that the Covid crisis increased seasonality in Vrnjačka Banja and Sokobanja. This is in agreement with Trajkov et al. (2022) conclusions, which highlighted that the health crisis increased seasonality in all regions of Serbia.

The value of the Gini index is the value of the surface bordered on the Lorenz curve graph and the direction of the distribution area. The proportions of the months in one year are rounded on two decimals and they are cumulatively shown on x −axis, while on the y −axis shows the total number of tourist overnight stays that belong to certain proportions of the months of the year. In the case when the number of tourist

overnight stays is the same in all months of the one year, we have that the graph of the Lorenz curve coincides with the line of equality.

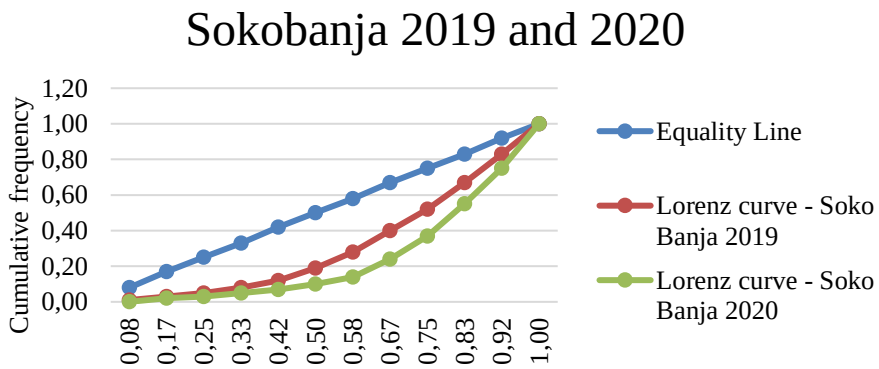
The plots of the Lorenz curves are given on the figures below for each of the three spa centres (Figures 2–4). Here we presented only the years with the highest and lowest values of the Gini index for the considered spa centres.

Figure 2: *Plot of the Lorenz curve for data on Vrnjačka Banja*



Source: *Authors' findings*

Figure 3: *Plot of the Lorenz curve for data on Sokobanja*

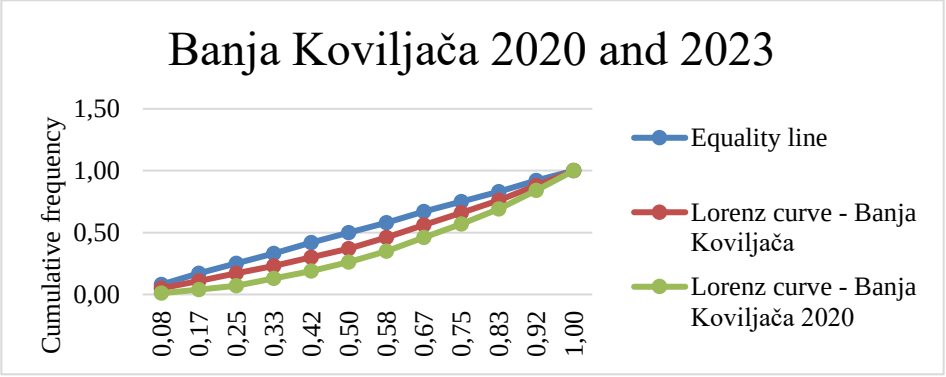


Source: *Authors' findings*

As one of the measure for reduction of tourism seasonality, the promotion of various different tourism forms could be developed. Following that, seasonality could be reduced with introducing and finding the new projects with the main aim of allowing the use of accommodation through the year. Similar research was conducted, for example, in the Republic of

Korea, Iceland and the Republic of Serbia for protected mountain areas (Pavlović el al., 2022).

Figure 4: *Plot of the Lorenz curve for data on Banja Koviljača*



Source: *Authors' findings*

The significance of this work lies in analyzing seasonality of selected spa centres in order to propose and design future strategies and economic measures to reduce this phenomenon aiming at the proper use of tourist facilities, especially during possible future health crisis.

Conclusions

In this paper, we have proposed a method for analyzing seasonality of tourists overnight stays in the selected spa centres in Serbia. Further analysis could go in the direction of identifying geographical territory and other requirements which could allow greater annual stability. The methodology applied here could be used in comparing the intensity of seasonality in several destinations over time. So, it would be interesting to investigate the effects of seasonality to the local population, and also the ways in which the seasonality in some destination is affected by emission centres, traffic, etc.

The methodology presented here could help in defining the seasonality reduction model and it could be useful in creating a strategic plan for this problem and creating „all time" destinations. In order to reduce the influence of seasonality and increase the sustainability of selected resorts, it is important to combine different types of tourism, expand the services offered and even create links with the other nearest tourism centres (e.g. mountain centres).

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